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Equipment Operational Requirements

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For a 100km section of the Iraq-Iran border in the Maysan Swamp Region

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Logic

The Iraq Department of Border Enforcement is rich in personnel, but poor in equipment. An effective border control system must include detection, discrimination, decision, tracking and interdiction, capture, identification, and disposition. An equipment solution that addresses only a part of this will not succeed, likewise equipment by itself is not the answer without considering the personnel and how they would employ the equipment. The solution should take advantage of the existing in-place system and address all of the critical functions.

The solutions are envisioned as being implemented in a phased manner, where Solution 1 is followed by Solution 2 and eventually by Solution 3. This allows adequate time for training and gaining operational experience for successively more complex equipment. Detailed descriptions of the components follow the solution descriptions.

Solution 1. This solution is based on changes to CONOPs, and does not have a technology component. It consists of observers at the forts and annexes, forward patrols along the swamp edge, in depth patrols approximately 10 kilometers inland from the swamp, and checkpoints on major roads.

Solution 2. This solution adds a ground sensor array to the Solution 1 system.

Solution 3. This solution is based around installing a radar/video camera system on each fort. It employs the CONOPS from Solution 1, but uses minimal ground sensors deployed only in areas with poor radar/ video camera coverage (such as canals and streams shielded by vegetation), or by roads covered by radar but outside the range of the radar associated cameras.

This document provides broad operational requirements for major equipment components along with sufficient operational details to allow the technical community to identify potential hardware candidates. Continuing analysis will develop quantities required and more detailed tactics, techniques, and procedures.

Operational Concept

The border enforcement mission contains three major components: the operational element, the support element, and the command and control element. This mission leads to suspect interdiction,

after which the suspect is passed over to the national police for processing (this police processing is beyond the scope of this concept). The components of this mission are executed, in various degree, at three types of fixed facilities: forts, annexes, and battalion headquarters.

Forts are the primary operational element with responsibility to detect, track, and interdict smugglers. They are assigned an area of operations where they execute this responsibility under the command of a captain. Forts employ annexes, as subordinate fixed facilities to extend their coverage within their area of operation.

Major fort operational missions include: local command and control (including developing a common operational picture of the fort's operational area activities), border observation, patrolling, traffic inspection, suspect interdiction, search and seizure of contraband and evidence (including evidence preservation), and detaining suspects for national police. Major fort support missions include supporting annexes, providing living quarters for fort personnel, and providing fort security.

All personnel including those working in annexes live at the fort, leaving it when necessary to accomplish their duties and then returning. These duties include manning a rooftop observation post, manning a checkpoint on the major road adjacent to the fort, and operating two vehicle patrols – which also will establish temporary roadblocks. The command element within the fort monitors sensor and camera data as well as observations from observation posts and patrols. From this the element maintains a common operational picture and controls interdiction efforts. Command is executed either directly or over radio communications.

Annexes are small permanent structures occupied 24/7 on a shift basis by personnel from the fort. Under control of a lieutenant, their personnel extend the control and observation capability of the fort. The major missions of annexes include border observation, traffic inspection, and annex security. Annexes have limited autonomy and have secure radio communications with the fort.

Annexes are not designed to be living quarters and are an operational element. Limited command authority is given to the officer in charge, who is expected to defer complex decisions to the fort commander. Basic decisions involve searching personnel at the checkpoint and temporary apprehension of suspects. Support at the annex is limited to cooking and sanitary facilities, as well as local defense structures.

Battalion headquarters is the major command and support center for the battalion's area of operation. It is a complex housing the battalion staff, the battalion response and security force, and the battalion motor pool.

The battalion headquarters provides command and control of the subordinate forts, and coordinates actions between forts and fort areas. In order to accomplish the command and control function, the battalion operations section sees the same data available at the forts, including patrol locations, sensor and radar detections, and camera views. The battalion uses this extensive situational awareness to provide tactical support and a backup interdiction capability from the battalion response force. An additional capability supporting the command and control role is an intelligence section that accepts

intelligence from higher organizations, develops trends from fort activities and information, and develops the intelligence picture and alerts for the battalion staff and forts. The second major support role is logistic support for all battalion assets. This includes automotive maintenance for battalion vehicles and generators, fuel storage and supply, electronic maintenance for communications and radar systems, and sensor field support (including maintenance, battery replacement, and sensor repositioning).

Agent:

Agents are employed in observation posts, checkpoints, patrols, and response forces. They are trained in defensive tactics (weapons, elementary squad-level tactics, security); law enforcement processes (including behavioral observation and questioning, evidence collection and preservation, and interdiction and arrest tactics); and border enforcement processes (including tracking and sign cutting, checkpoint operations, observation, and interdiction).

1. Operations: Agents operate under the control of an officer or non-commissioned officer in the performance of their duties. They live at the fort and are transported to duty as necessary. Agents on patrol work closely with the local communities and acquire extensive local knowledge. The typical agent shift is 12 hours; however those on checkpoints and observation posts are frequently rotated during their shift.
2. Major equipment items: (use standard equipment employed in the Iraq armed forces)
    a. Pistol
    b. Rifle
    c. Canteen
    d. Flashlight
    e. Restraints
    f. Reflective vest
    g. Body armor

Observation post:

Observation posts are located on rooftop towers on all forts and annexes. They are provided with environmental shielding from sun and wind, and are configured to provide protection to the observers from weapons fire.

1. Operations. Observation posts are manned with two personnel from the fort or annex staff on a 24/7 basis. They observe the edge of the swamp and road net employing optics and thermal equipment. They report to the guard officer all traffic and suspicious activity. They also overwatch the fort or annex checkpoint.
2. Major equipment items
    a. Binoculars
        i. Capable of distinguishing individuals on foot at a distance of 4 km
        ii. Capable of operation under low light conditions

b. Fixed, high power binoculars
    i. Capable of distinguishing suspicious behavior such as a small package being passed from one person to another, at a distance of 4 km.
    ii. Fixed mount such as a pedestal
    iii. Protective covers for optics
c. Thermal imager
d. Machinegun
    i. Medium machinegun
    ii. Capable of dual use (antipersonnel and antivehicular)
    iii. Spare barrel and associated equipment
    iv. Tripod or pedestal mounted
e. Landline telephone to guard commander (inside fort or annex)

Patrol:

Patrols are provided from the fort staff to provide presence along the border, patrol routes within the forts operational area, interact with anyone encountered and observe any suspicious activity or evidence of such. They provide 24/7 coverage.

1. Operations. Each fort provides two patrols which consist of a Sergeant and two men mounted in a pickup truck equipped with a machinegun and a radio. One of the patrols covers the swamp edge while the other (the deep patrol) patrols the road network approximately 10 km back from the swamp. The patrol leader has the authority to stop, question, and search all whom he encounters. In order to maximize the effectiveness of the patrols, they talk to all travelers, similar to the way a game warden operates. If the travelers are not recognizably from the local area, the patrol will check their papers. Regardless, if the travelers act suspicious or nervous, the patrol will do a quick inspection of their vehicle contents. The patrol will report all encounters so that the fort can develop an intelligence database of normal local travel. The patrol will also look for any suspicious activity and investigate it. Along the swamp edge, they will brush the road edge each morning with a drag and then look for tracks during the day. If directed, the patrol will establish an interdiction checkpoint employing cones and tire strips.
2. Major equipment items:
    a. Pickup truck
        i. Crew cab truck, with hardened rear passenger compartment for suspect transport
        ii. Bed capable of carrying 4 personnel plus the machinegun mount
        iii. Offroad/sand tires
        iv. 4 wheel drive
        v. Air conditioned cab
    b. GPS tracker
        i. Provides periodic digital position updates
        ii. Transmits position data automatically over the vehicle radio

iii. Tamperproof

c. Vehicle mounted radio
   i. Secure voice
   ii. Digital data transmission
   iii. Sufficient transmission power to communicate line of site 30km
d. Machinegun
e. Chain drag
   i. Brush or drag capable of smoothing tracks on road edge
   ii. Bumper hitch towing system
f. Tire strips
   i. Law enforcement-type tire shredding device
g. Traffic control cones
h. Pioneer tools
i. Water cooler
j. First aid kit
k. Binoculars
l. Night vision optics

Checkpoint:

As the forts and annexes are located adjacent to the major roads, they will operate checkpoints on their local roadway 24/7. Forts can also establish temporary checkpoints on other routes as needed. Fort and annex checkpoints consist of two men, a sergeant and one other with a moveable barrier.

1. Operations. Checkpoints will check papers and do a vehicle contents inspection if occupants act suspiciously or nervous. If ordered, checkpoints will conduct a detailed search of all vehicles (normally augmented with 2 more men and a Lieutenant for this). Checkpoints are overwatched by the fort or annex observation post, and response assistance is provided by the guard officer and off duty personnel.
2. Major equipment items:
   a. Moveable barrier
   b. Tire strips
   c. Warning signs
   d. Under vehicle mirror
   e. Communications
   f. Bolo poster
   g. Digital camera

Sensor Net:

Unattended ground sensors are placed to detect vehicle traffic on specific roads and trails. These sensors are positioned as strings on both potential smuggler transfer points and possible vehicle routes

(including less traveled routes seldom used by local citizens). The sensors consist of simple seismic and metallic sensors, augmented by motion activated still image systems.

1. Operations. Sensor detections and images are passed through simple repeaters to a sensor watch station at the fort. Sensors are positioned in a string along the routes of interest, so that sensors must be activated in sequence to be considered a legitimate target. (Sensors have the capability to be placed individually, however this can lead to false targets.) Locations of sensor hits are passed by radio to patrols to investigate or to establish interception roadblocks. The pattern of sensor activations guides the selection of locations for roadblocks. The sensor network is frequently repositioned to avoid smuggler discovery.
2. Major equipment items:
    a. UGS
        i. Seismic and metallic detectors with at least 10 meter radius of detection
        ii. Multi-channel RF data communication from sensor to gateway, 100m range
        iii. At least 6 month battery life
        iv. Sensors time out and reset at 2 minutes after activation
        v. Self-organizing short range RF network (linking sensors inside the sensor field)
        vi. Integrated GPS on each sensor
        vii. Gateway that collects information from sensors and communicates at least 2 km to the radio relay
        viii. When sensor is installed and turned on, it's status and location automatically appear on GIS display at the fort
        ix. Sensor health periodically transmitted to GIS display
        x. Tamperproof – a method of alerting that the sensor has been moved or disabled
    b. Radio relay
        i. 20km range
        ii. Camouflaged
        iii. At least 6 month battery life
        iv. Bandwidth capable of transmitting a 2 megapixel image within five minutes
    c. Motion activated digital still image camera
        i. Motion activated at 10 meters
        ii. IR flash for night photography
        iii. 1-2 megapixel resolution
        iv. RF link into the sensor relay system
        v. Camouflage
        vi. 6 month battery life

Radar/Camera System:

A combined ground surveillance and camera system is mounted on a tower on each fort. The radar is a Doppler system to detect and track moving targets. The camera capability combines normal zoom optics with a collinear thermal system.

1. Operations. The radar system will detect moving targets and allow the operator at the fort to select targets for tagging in order to maintain a track. It will also alert based on target behavior (such as stopping in an area of interest) and automatically slew the associated camera to allow investigation). Fort spacing provides 100% radar coverage of the swamp border with significant overlap, but only 64% coverage by collocated cameras. Camera-only systems are mounted on annexes to extend the border surveillance coverage. The camera and associated thermal imager are under control of the operator to pan and zoom to examine suspicious areas or activities. The details of the operator station are discussed under the fort section.
2. Major equipment items:
    a. Tower
        i. Stable in motion and vibration to fall within stabilization limits of camera, FLIR, and radar
        ii. Sufficiently high to support radar operations and provide personnel safety
    b. Ground surveillance Doppler radar
        i. Detect vehicle target at 15 km
        ii. Detect using Doppler technology targets moving greater than .5m/sec
        iii. Able to switch to standard echo return to track a designated target
    c. Remote controlled pan and zoom electro-optic camera
        i. Operator controlled positioning and zooming option
        ii. Computer controlled positioning and zooming based on radar or sensor array trigger event
        iii. Capable of observing human activity at 5 km
    d. Collinear thermal imager (FLIR)
    e. Microwave data communication system

Annex:

Annexes are field operating facilities that provide additional observation posts and checkpoints. These include an environmental shelter, with necessary electricity and radio communications, and a observation position on the roof. Each annex also operates a checkpoint on the major adjacent route.

1. Operations. The annex is staffed by a Lieutenant and 6 men. This allows a two man observation post on the roof, a two person checkpoint, and the remainder as security and replacements. The annex obtains its support (including transportation) from the fort, and personnel living quarters are also located there. Annexes are staffed in shifts from the fort. When the radar/camera system is implemented, the annex has a camera on a tower with microwave data path to the fort to augment the camera coverage from a secure location.
2. Major equipment items:
    a. Radio
    b. External lighting
    c. Power
    d. HVAC

e. Bathroom and kitchen facilities
f. Defensive structures
g. Remote controlled camera and microwave link to fort

Fort: Forts provide operational area (OA) control under command of a Captain. They consist of living quarters, motor pool with vehicle park and refuel facility, defensive positions, rooftop observation posts, and an operations center. All personnel in the OA live at the fort and deploy to man annexes or to patrol. Each fort and annex operates rooftop observers and road checkpoints on the major routes passing their locations. The fort operations center monitors all sensor, radar, and camera information. It then acts as the command center to direct interdictions. Data is archived on a server. BOLO information is received from battalion and printed for dissemination to checkpoints and patrols.

1. Command operations. The fort command center contains the operations lieutenant and operations specialist that monitors patrol operations and sensor status on a GIS display, augmented by a voice radio.
2. Command and Operations major equipment items:
    a. Common Operational Picture GIS display
        i. Fort area of operation map background
        ii. Display sensor locations, status, and activations
        iii. Display track from sensor hits
        iv. Display patrol locations
        v. Display radar track
        vi. Automatically record GIS view and allow playback
    b. Still image display & recorder
        i. Location of image is related to a location indicator on the GIS display
        ii. Image is date and time stamped
        iii. Display will alert when new image received
        iv. Images archived on local server
    c. Radar & camera display and control
        i. Allow operator to electronically tag a radar target
        ii. Automatically track tagged targets
        iii. Allow operator to clear specific tracks and tags
        iv. Automatically slew camera to a selected target
        v. Automatically record on DVR camera images of interest with 7 days of storage
    d. Radio base station
    e. Color printer
3. Support function operations. This category includes all functions and operations necessary to support the patrols, annexes, and checkpoints. Operations support includes transport for annex staff daily shift changes, a holding cell for suspects until they can be either transported to battalion or picked up by police, and a refuel facility for fort vehicles. The bulk of the remaining support is dedicated to life support for the fort staff, which when provided at an adequate level

is a significant component to agent effectiveness. This includes both basic living needs for agents and also their off duty facilities.

4. Support function major equipment items:
    a. Personnel transport van
    b. Hardened suspect holding cell
    c. Power generation capability sufficient to power all fort equipment, with redundancy sufficient to power critical equipment (such as radios, sensor receivers, etc.)
    d. HVAC for living quarters and operations
    e. Living quarters, including bathrooms, showers, and kitchens, dayroom, and satellite television
    f. 100 foot weapons range with containing protective berm
    g. Microwave data communications system
    h. Refueling facility with storage

Battalion Headquarters: The battalion headquarters controls and oversees all border enforcement actions carried out by the forts in the battalion area. This includes: command, Intelligence, maintenance (vehicle, electronics, and sensor), reaction force response, and sector support functions. Support functions provide technicians to accomplish basic levels of automotive and electronic maintenance, as well as sensor technicians to test and install ground sensors, test communications links, and test radars, electro-optical cameras, and FLIRS for correct functioning.

1. Operations. Battalion command and operations overwatches activities across all fort areas of responsibility. They have an operation center that connects to all forts and displays in real time the data from the fort C2 systems – with the same systems found at the fort. Data from the forts is archived at battalion. The operation center coordinates actions across fort area boundaries, including multiple fort responses. The battalion also has the response force for the battalion sector, and will employ it against specific threats or as a backup to a fort if necessary.
2. Major operation center equipment items:
    a. Displays of all data from the forts (GIS and imagery received in realtime from the forts over microwave links)
    b. Microwave data link to forts
    c. Archival server for fort data for long term storage
    d. Voice radio system providing reliable encrypted communications with forts and brigade
    e. Intelligence computer to maintain local intelligence files and data received from brigade
    f. Microwave data link to brigade
3. Major response force equipment items:
    a. Pickup truck
        i. Crew cab truck with hardened rear passenger compartment for suspect transport
        ii. Bed capable of carrying 4 personnel plus the machinegun mount
        iii. Offroad/sand tires
        iv. 4 wheel drive

        v. Air conditioned cab
    b. GPS tracker
        i. Provides periodic digital position updates
        ii. Transmits position data automatically over the vehicle radio
        iii. Tamperproof
    c. Vehicle mounted radio
        i. Secure voice
        ii. Digital data transmission
        iii. Sufficient transmission power to communicate line of site 30km
    d. Anti-vehicular rockets
4. Major support equipment items:
    a. Motor pool maintenance system. This is the required diagnostic and repair tools necessary to conduct first level maintenance of the battalion's vehicles
    b. Communications maintenance system. This is a set of diagnostic equipment necessary to check the radio system, including antennas and transmission lines. It also includes necessary tools to allow replacement of common components
    c. Sensor system maintenance. This is a set of diagnostic equipment necessary to check the UGS sensors, radio relays, displays, radars, electro-optic cameras, FLIRS. It also contains any necessary tools to allow replacement of common components and batteries.